

Section III (Remarks)

A. Summary of Amendment to the Specification and Claims

By the present Amendment, paragraph [0047] has been amended to include the definition of R^3 from original claim 6. Since, under U.S. law, original claims provide support for subject matter added to the specification, this amendment does not add new matter.

By the present Amendment, Claim 11 has been incorporated to include the limitations of Claim 16, and Claim 16 has been cancelled. Claim 20 has been amended, and Claim 29 has been added. Claim 29 provides lists of specific 1,3-diketone compounds, and $-\text{SiR}^4\text{R}^5\text{R}^6$ silylated derivatives of 1,3-dicarbonyl compounds. Support for the newly added claims is found in the specification at least in paragraphs [0049] and [0050].

No new matter within the meaning of 35 U.S.C. §132(a) has been introduced by the foregoing amendments.

The amendments made herein are fully consistent with and supported by the originally-filed disclosure of this application.

B. Interview with the Examiner

Applicants wish to thank the Examiner for the helpful interview held on November 14, 2008. Although agreement was not reached, Applicants agreed to opt for option a) with respect to point 4 of the Office Action.

Applicants agreed to list Formula III in Claim 11 to further define the 1,3-dicarbonyl compounds, and indicated that they would add a claim to specifically list those 1,3-dicarbonyl compounds that fall within the scope of Claim 11 as amended.

The Examiner may note that although the specification listed methyl and ethyl glycoxyate as 1,3-dicarbonyls, these compounds were not specifically listed in new Claim 29, because, as the Examiner requested, the undersigned attorney reviewed the list of 1,3-dicarbonyl compounds in the specification and determined that glycoxylic acid is a

1,2-dicarbonyl compound, rather than a 1,3-dicarbonyl compound. It is believed that these two were the only erroneously listed compounds.

With regard to the alkoxy leaving groups, Applicants indicated that they would provide a literature reference showing an ortho acid ester rather than an acetal (although, perhaps more correctly stated in this case, given the cyclic system, this would be a hemiorthoester versus a hemiketal), and would also cited to Green and Wuts, Protective Groups in Organic Synthesis for the proposition that methyl/alkyl groups can be cleaved off without cleaving the ring.

C. Rejection of Claims 11-28 Under 35 U.S.C. § 112

Claims 11-28 were rejected under 35 U.S.C. 112, second paragraph, as indefinite. The purported basis for the rejection is that the term “1,3-dicarbonyl compound” is of unclear scope. This rejection is respectfully traversed if applied to the amended claims.

Claim 11 has been amended as discussed with the Examiner to further define the 1,3-dicarbonyl compounds with reference to Formula III, and this formula has been amended to further specify that at least one of R^2 and R^3 is H. This amendment has now clarified the subject matter being claimed, and is believed to obviate the rejection.

D. Rejection of Claims 13, 14, 18, 20, and 27 Under 35 U.S.C. § 112

Claims 13, 14, 18, 20, and 27 were rejected under 35 U.S.C. 112, second paragraph, as indefinite.

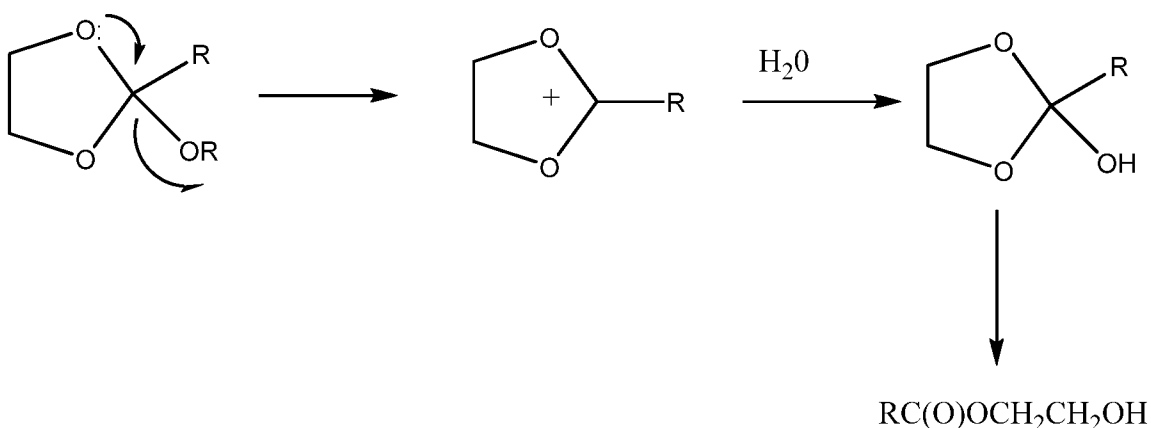
Rejection Based on the Use of Alkoxy and Aryloxy Leaving Groups

Claims 14 and 27 were rejected as non-enabled, on the purported basis that X cannot be alkoxy or aryloxy, as these groups are incapable of functioning as leaving groups in the chemistry as claimed. As this is chemically untrue, Applicants respectfully traverse.

Contrary to the Office Action’s assertion, under acid conditions, particularly when there is neighboring group participation (i.e., the neighbor is the ring oxygen adjacent to the alkoxy group, which can stabilize the carbocation intermediate), alkoxy and aryloxy

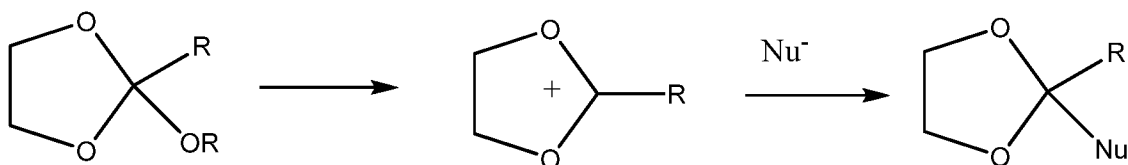
groups can function as leaving groups. See, for example, McClelland and Seaman, A change in rate-determining step in the hydrolysis of cyclic ketals,” Can. J. Chem., 62:1608-1612 (1984), found on-line at <http://article.pubs.nrc-cnrc.gc.ca/ppv/RPViewDoc?issn=1480-3291&volume=62&issue=8&startPage=1608>, a copy of which is attached. For the Examiner’s ease of review, arrows have been provided to show the flow of electrons to produce the stabilized carbocation intermediate.

The chemistry of the cleavage of a cyclic ortho esters such as **1** (2-alkyl or aryl-2-alkoxy- 1,3- dioxolanes is shown below.

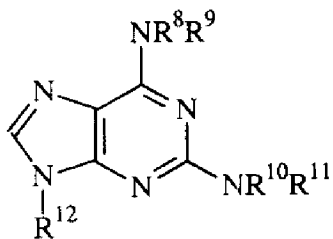


The hydrolysis of the ortho esters involves using water as a nucleophile. When there is a different nucleophile, the carbocation intermediate can react with this other nucleophile.

Accordingly, the following scenario illustrates where a nucleophile like the one in the claimed chemistry is shown to replace the alkoxy/aryloxy leaving group.



In the chemistry as claimed, Nu⁻ is



As further support for the proposition that the exocyclic alkoxy or aryloxy group will leave before the ring will cleave, the Examiner's attention is drawn to page 1610, which discusses hemiketals as well as hemiorthoesters, Table 1, which shows relevant rate constants for hemiketals as well as hemiorthoesters, and page 1612, which discusses the apparent "entropic disadvantage to ring opening."

While during the interview, Applicants undersigned representative pointed to the first page of the paper as teaching the mechanism for cleavage of a hemiorthoester, the paper does discuss hemiketals as well, and the discussion of the entropic disadvantage to ring opening shows why the exocyclic alkoxy or aryloxy will cleave before the ring ether bonds. Thus, it is reasonable to substitute a hemiketal for the hemiorthoester structure shown above and expect substantially the same course of events, namely, that there will be a stabilized carbocation formed within the ring, which will react with a nucleophile.

Accordingly, since there is no legitimate scientific basis for maintaining this ground of rejection, withdrawal of same is respectfully requested.

Rejection of Claim 18 Based on the Use of Alkyl (methyl) Protecting Groups for Amines

Claim 18 was rejected on the purported basis that alkyl (such as methyl) groups are not protecting groups for amines. Applicants respectfully traverse.

Theodora W. Greene wrote her Ph.D. thesis on protective groups in organic synthesis, and her thesis was so well received, it served as the foundation for the best-selling chemistry book, Greene and Wuts, Protective Groups in Organic Synthesis (Third Edition), John Wiley & Sons, Inc., 1999. This text has been cited in thousands of U.S. patents, and is the pre-eminent text in this area.

N-alkyl protective groups, including their formation and cleavage, are mentioned on page 573 of Protective Groups in Organic Synthesis. For example, the methyl group in a methylamine can be cleaved photochemically in the presence of an electron acceptor such as 9,10-dicyanoanthracene. The book provides eight other ways to cleave this group. Pertinent portions of the book are attached for the Examiner's ease of review.

Accordingly, since Applicants have provided evidence for using alkyl groups as protecting groups for amines, Applicants respectfully request that the rejection be withdrawn.

Rejection of Claim 13 Based on the Use of Alkyl Protecting Groups for Alcohols

Claim 13 was rejected on the purported basis that R1 as alkyl is mistaken, since methyl is not a protective group for hydroxyl in the instant context. Applicants respectfully traverse.

Pages 23 and 24 of Protective Groups in Organic Synthesis disclose the formation and cleavage of methyl ethers. Most of the disclosed cleavage methods are selective for methyl ethers, and are thus amenable to use in the claimed methods.

Accordingly, since Applicants have provided evidence for using alkyl groups as protecting groups for hydroxyl groups, Applicants respectfully request that the rejection be withdrawn.

Rejection of Claim 20 for Lack of Clarity

The Office Action rejected Claim 20 on the basis that it was unclear. The basis for the rejection is that if R^1 is removed, and protecting groups R^8 - R^{11} are still present, then the formula is incorrect. The Examiner suggested amending the claim to state that the amine protective groups have also been removed, and the claim has been amended accordingly. Support for the amendment is found, at least, on paragraph [0082] of the published application. Thus, Applicants respectfully request that the rejection be withdrawn if applied to the amended claim.

Rejection of Claim 14 as Non-Enabled

Claim 14 was rejected under 35 U.S.C. 112, first paragraph, as non-enabled. The purported basis for this rejection is that X cannot be alkoxy or aryloxy. This issue has been addressed above, with respect to the 112, second paragraph rejection. For the same reasons, Applicants respectfully request withdrawal of this rejection.

Rejection of Claim 18 as Non-Enabled

Claim 18 was rejected under 35 U.S.C. 112, first paragraph, as non-enabled. The purported basis for this rejection is that the leaving group purportedly cannot be alkyl. This issue has been addressed above, with respect to the 112, second paragraph rejection. For the same reasons, Applicants respectfully request withdrawal of this rejection.

E. Amendments to the Specification

The Office Action stated (page 3) that the term R^3 was not defined in the specification. The specification has been amended to address this issue, providing the definition from original Claim 6.

Paragraph [0047] of the specification states:

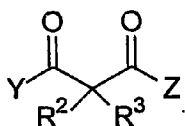
[0047] R^2 and R^3 in the general formula (3) may be independently of one another and R^2 in the general formula (4) may be hydrogen, an acyl radical of an aromatic or aliphatic carboxylic acid having

from 2 to 20 C atoms, an alkyl radical having from 1 to 20 C atoms
or an aryl radical having from 6 to 20 C atoms and

The priority application included claims 1-10, which were originally filed in the U.S., then cancelled in favor of Claims 11-28. Originally-filed claims can provide support for a claim term.

In the original PCT application, Claim 6 defined the R³ substituent.

6. Verfahren nach einem oder mehreren der Ansprüche 1 bis 5, dadurch gekennzeichnet, dass als 1,3-Dicarbonylverbindung ein β -Carbonylcarbonsäureester, ein 1,3-Diketon oder ein Malonsäurederivat mit 5 bis 20 C-Atomen der allgemeinen Formel (3) verwendet wird,



Formel 3

wobei

Y und Z unabhängig voneinander Wasserstoff, einen Alkylrest mit 1 bis 20 C-Atomen, einen Arylrest mit 6 bis 20 C-Atomen oder eine Alkyloxygruppe mit 1 bis 20 C-Atomen und

R² und R³ unabhängig voneinander Wasserstoff, einen Acylrest einer aromatischen oder aliphatischen Carbonsäure mit 2 bis 20 C-Atomen, einen Alkylrest mit 1 bis 20 C-Atomen oder einen Arylrest mit 6 bis 20 C-Atomen

bedeuten können.

As stated in the preliminary amendment:

The application has been amended to conform certain portions thereof to accepted American English usage, and to add recommended United States Patent and Trademark Office headings and subheadings. The claims have been amended to place them into U.S. format, and to eliminate multiple dependent claims. An Abstract has been added. None of the amendments involve addition of any new matter. Early favorable consideration is respectfully requested.

Claim 16 is the equivalent of originally-filed Claim 6, except that it is not multiply dependent on Claims 11-15 (as original Claim 6 was dependent on Claims 1-5); rather, it is only dependent on Claim 11.

Claim 11 defines R^2 and R^3 as, independently of one another, being selected from hydrogen, an acyl radical of an aromatic or aliphatic carboxylic acid having from 2 to 20 C atoms, an alkyl radical having from 1 to 20 C atoms and an aryl radical having from 6 to 20 C atoms.

Accordingly, the amendment to the specification provides support for this definition of R^3 , and adds no new matter because of support from originally-filed claims.

CONCLUSION

Based on the foregoing, all of Applicants' pending claims are enabled and patentably distinguished over the art, and in form and condition for allowance. The Examiner is requested to favorably consider the foregoing, and to responsively issue a Notice of Allowance. If any issues require further resolution, the Examiner is requested to contact the undersigned attorney at (919) 419-9350 to discuss same.

Respectfully submitted,

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